

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

# PCT

## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

To:		Date of mailing (day/month/year) see form PCT/ISA/210 (second sheet)	
see form PCT/ISA/220			
Applicant's or agent's file reference see form PCT/ISA/220		FOR FURTHER ACTION See paragraph 2 below	
International application No. PCT/EP2004/050527	International filing date (day/month/year) 15.04.2004	Priority date (day/month/year) 15.04.2003	
International Patent Classification (IPC) or both national classification and IPC G01V1/38			
Applicant WESTERNGECO SEISMIC HOLDINGS LIMITED			

### 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application


### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

### 3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:	Authorized Officer
 <p>European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016</p>	<p>De Bekker, R</p> <p>Telephone No. +31 70 340-4094</p>



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**International application No.  
PCT/EP2004/050527**Box No. I Basis of the opinion**

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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**Box No. II Priority**

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1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. ☐ It has not been possible to consider the validity of the priority claim because a copy of the priority document was not available to the ISA at the time that the search was conducted (Rule 17.1). This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

4. Additional observations, if necessary:

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**Box No. III Non-establishment of opinion with regard to novelty, inventive step and Industrial applicability**

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application,
- ☒ claims Nos. 17, 20-25, 27-31, 46-51, 53-57, 61, 63-79

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):
- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the whole application or for said claims Nos. 17, 20-25, 27-31, 46-51, 53-57, 61, 63-79
- ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:
  - the written form ☐ has not been furnished
  - ☐ does not comply with the standard
  - the computer readable form ☐ has not been furnished
  - ☐ does not comply with the standard
- ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.
- ☐ See separate sheet for further details

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**Box No. IV Lack of unity of invention**

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1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:
- ☐ paid additional fees.
  - ☐ paid additional fees under protest.
  - ☒ not paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
  - ☒ not complied with for the following reasons:  
**see separate sheet**
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
  - ☒ the parts relating to claims Nos. 1-16,18,19,26,32-45,52,58-60,61b,62

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**Box No. V Reasoned statement under Rule 43b/s.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	7,9-11,13,38-40,42,61b
	No: Claims	1-6,8,12,14-16,18,19,26,32-37,41,43-45,52,58-60,62
Inventive step (IS)	Yes: Claims	
	No: Claims	1-16,18,19,26,32-45,52,58-60,61b,62
Industrial applicability (IA)	Yes: Claims	1-16,18,19,26,32-45,52,58-60,61b,62
	No: Claims	

2. Citations and explanations

**see separate sheet**

**Re Item IV.**

- 1 Prior to any statement regarding non-unity, it is noted that the search authority found irregularities in the claim numbering: at least claims 61 and 64 appear twice, although they contain different subject-matter.  
To overcome this problem, reference is made to the respective claims as 61a, 61b, 64a and 64b.

- 2 The separate groups of inventions are:

1. Claims: 1-16,18,19,26,32-45,52,58-60,61b,62

This first group of claims solves the objective problem of improving positioning information applicable to a seismic survey system and method which comprises: a source array; an independently steerable deflector device to control the position of the array; and a positioning system comprising a positioning unit mounted on the array to determine the location of the source array with a controller operationally connected to control the position of the deflector, by means of the special technical feature, defined by the subject-matter of claim 7, being the use of GPS positioning, thereby enabling more accurate 4D surveying.

2. Claims: 17,20-24,46-50,61a,64a

This second group of claims solves the objective problem of improving the usability of the deflector in a seismic survey system and method which comprises, a source array; an independently steerable deflector device to control the position of the array; and a positioning system comprising a positioning unit mounted on the array to determine the location of the source array with a controller operationally connected to control the position of the deflector, by means of the special technical feature being technical details on the construction of the deflector, thereby improving depth control and buoyancy characteristics as well as endurance.

3. Claims: 27-31,53-57

This third group of claims solves the objective problem of preventing damage due to floating debris applicable to a seismic survey system and method which comprises: a source array; an independently steerable deflector device to control the position of the array; and a positioning system comprising a positioning unit mounted on the array to determine the location of the source array with a controller operationally connected to control the position of the deflector, by means of the special technical feature being a forward looking acoustical transducer and receiver to enable obstruction detection and avoidance.

4 Claims: 25,51,63,64b-79

This fourth group of claims solves the objective problem of improving efficient adjusting of relative positioning of a plurality of source arrays in a seismic survey system without the otherwise necessary re-trimming of the available deflectors by means of the special technical feature being a winch attached to distance ropes mounted between the respective source arrays, thereby enabling adjustment of relative distances.

3 These groups of inventions are not so linked as to form a single general inventive concept (Rule 13.1 PCT) for the following reasons:

- Related prior art:

D1: EP-A-0 018 053 (SHELL INT RESEARCH) 29 October 1980 (1980-10-29)

- The application, contains four independent claims: 1, 32, 58, 63.

These describe systems and methods which relate to seismic survey systems and methods which comprise at least one source array; an independently steerable deflector device to control the position of the array; and a positioning system comprising a positioning unit mounted on the array to determine the location of the source array with a controller operationally connected to control the position of the deflector.

- For claims 1, 32, 58, the prior art D1 (EP'053) discloses (abstract; Fig. 1-4,6; pg.2, ln.12-18; pg.10, ln.27-pg.11, ln. 14) such seismic survey systems and methods which comprise at least one source array; an independently steerable deflector

- device to control the position of the array; and a positioning system comprising a positioning unit mounted on the array to determine the location of the source array with a controller operationally connected to control the position of the deflector.
- All features of independent claims 1, 32, 58 are known by the prior art, which is not the case regarding the subject-matter of independent claim 63.
- 4 It is, furthermore, noted that also the features of dependent claims 2-6,8,12,14-16,18,19,26,33-37,41,43-45,52,57-60,62 are considered known from the prior art.
- As a consequence, regarding the respective other dependent claims, it is noted that the first characterising feature which is considered to be novel over the cited prior art is the subject-matter of claim 7 about the use of GPS on the array.
  - Therefore, the assessment of the characterising features of the independent claim 63 and the claims depending on any of claims 1, 32, 58, resulted in the separate groups of inventions as listed above.
- 5 Conclusion:

It appears thus that these groups of claims are not linked by a single general inventive concept because there are no common special technical features (1st: use of GPS; 2nd: details on construction of deflector; 3rd: forward looking acoustical transducer and receiver; 4th: winch attached to distance ropes). Since the problems are completely different (1st: improving positioning information; 2nd: improving usability of the deflector; 3rd: preventing damage of floating debris; 4th: improving adjustment of relative positioning), there are no corresponding special technical features.

The application does, therefore, not meet the requirements of unity of invention as defined in rule 13 (1)&(2) PCT.

**Re Item V.**

- 1 The following documents are referred to in this communication:



- D1: EP-A-0 018 053 (SHELL INT RESEARCH) 29 October 1980 (1980-10-29)  
D2: WO 01/61380 A (SCHLUMBERGER CA LTD ; SCHLUMBERGER  
SERVICES PETROL (FR); LINDTJORN OLA) 23 August 2001 (2001-08-23)  
D3: US-A-4 748 599 (GJESTRUM EINAR ET AL) 31 May 1988 (1988-05-31)  
D4: US-A-4 323 989 (HUCKABEE KERMIT D ET AL) 6 April 1982 (1982-04-06)  
D5: EP-A-0 168 959 (TEXAS INSTRUMENTS INC) 22 January 1986 (1986-01-  
22)  
D6: US-A-4 845 686 (BRAC JEAN) 4 July 1989 (1989-07-04)  
D7: US-A-6 011 753 (CHIEN LORING C) 4 January 2000 (2000-01-04)

**2 INDEPENDENT CLAIMS 1, 32, 58:**

- 2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.
- Document D1 (EP'053) discloses (the references in parenthesis applying to this document) (abstract; Fig. 1-4,6; pg.2, ln.12-18; pg.10, ln.27-pg.11, ln. 14) a seismic survey system which comprises at least one source array; an independently steerable deflector device to control the position of the array; and a positioning system comprising a positioning unit mounted on the array to determine the location of the source array with a controller operationally connected to control the position of the deflector.
  - Document D6 for example can be considered equally relevant (see eg. abstract; Fig.1; col.4, ln. 29-38).
  - As such claim 1 does not fulfil the novelty requirements of Art. 33(2) PCT.
- 2.2 A similar reasoning as given for claim 1 will apply mutatis mutandis to the other independent claims 32 and 58 and as such these also do not fulfil the novelty requirements of Art. 33(2) PCT.

**3. DEPENDENT CLAIMS 2-16, 18, 19, 26, 33-45, 52, 59-62**

- Dependent claims 2-16, 18, 19, 26, 33-45, 52, 59-62 do not contain any features which, in combination with the features of any claim to which they refer, meet the

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requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT), also see references concerning prior art documents D1-D7 as cited in the international partial search report.